AMENDMENTS TO THE CLAIMS

1. (currently amended) Method for producing electricity from the heat produced in the core (5) of at least one high temperature nuclear reactor (1), which involves circulating a first heat-exchange gas or coolant gas in contact with the core (5) of the nuclear reactor (1) in a closed circuit, heating a second heat-exchange gas by heat-exchange with the first heat-exchange gas and using the second heat-exchange gas heated by the first heat-exchange gas to drive at least one gas turbine (2) coupled to an electric generator (4), characterised in that the first exchange gas consists ~~mainly~~ of helium, in that the second exchange gas contains substantially 50 to 70% by volume of helium and 50 to 30% by volume of nitrogen, in that the second heat-exchange gas is circulated in a closed circuit so that the second heat-exchange gas heated by the first heat-exchange gas drives the at least one gas turbine (2) and in that at least a first portion of the heat from the second exchange gas which has passed through the gas turbine (2) is recovered in order to heat and vaporise water in at least one steam generator (12) so as to produce steam for driving at least one steam turbine (3a, 3b, 3c) coupled to the electric generator (4).

2. (original) Method according to claim 1, characterised in that at least a second portion of the heat from the second exchange fluid is recovered in order to supply heat to an auxiliary installation (30) such as an urban heating system or a seawater desalination plant.

3. (currently amended) Method according to ~~either of~~ claim[[s]] 1 ~~and 2~~, characterised in that at least a fraction of the heat from the second heat-exchange gas heated by the first heat-exchange fluid is recovered to fulfill, prior to the driving of the gas turbine (2), a function such as the production of hydrogen which necessitates a very high temperature fluid.

4. (currently amended) Method according to ~~any of~~ claim[[s]] 1 ~~to 3~~, characterised in that the second heat-exchange gas is heated by heat-exchange with coolant gas from at least two nuclear reactors (1a, 1b) operating simultaneously and with coolant gas from at least one first nuclear reactor (1a, 1b) from among the at least two nuclear reactors, if at least a second nuclear reactor (1a, 1b) is inoperative.

5. (original) Device for producing electricity from the heat produced in the core (5) of at least one high temperature nuclear reactor (1) comprising a primary circuit (6) in which there circulates a first heat-exchange gas for cooling the core (5) of the reactor, a gas turbine (2) coupled to an electric generator (5) via a shaft (11) and a secondary circuit (9) for circulation of a second heat-exchange gas on which the gas turbine (2) is inserted, characterised in that it also comprises at least one intermediate heat exchanger (7) having a primary portion connected to the primary circuit (6) of the nuclear reactor (1) and a secondary portion connected to the secondary circuit (9) and heating the second exchange gas on the basis of the heat produced in the reactor core by the first heat-exchange gas, and a tertiary circuit (10) for circulation of water and steam, on which is disposed at least one steam generator (12) and at least one steam turbine (3a), the intermediate exchanger (7) and the gas turbine (2) having characteristics adapted to the use of helium as first heat-exchange gas and of a mixture of helium and nitrogen as second heat-exchange gas, and the steam generator (12) comprising a secondary portion connected to the tertiary steam and steam circuit (10) to receive water at the inlet and to provide steam at the outlet to the steam turbine (3a) and a primary portion connected to the secondary circuit (9) to receive the second exchange gas after it issues from the gas turbine (2).

6. (original) Device according to claim 5, characterised in that the tertiary circuit (10) also comprises a first heater exchanger (13a) of which the secondary portion is connected to the outlet of the first steam turbine (3a) forming a high pressure turbine to receive a wet steam and of which the outlet portion is connected to a second steam turbine (3b) or medium pressure turbine, a second heat exchanger (13b) having a second portion connected, via an inlet, to the outlet of the second medium pressure turbine (3b) to receive a wet steam and, at the outlet, to an inlet portion of a third steam turbine (3c) or low pressure turbine of which the outlet portion is connected to the circuit (10) on which a condenser (15) is placed, each of the first and second heat exchanger heaters (13a, 13b) having a primary portion supplied with second exchange gas from bypasses of the secondary circuit (9) to heat and dry the wet steam introduced at the inlet of the second portion of the heat exchanger heater and the tertiary circuit (10) being in a closed

circuit which enables the water recovered in the condenser (15) to be conveyed to the inlet of the secondary portion of the steam generator (12).

7. (original) Device according to claim 6, characterised in that a counter-current heat exchanger (16) is disposed on a portion of the tertiary circuit (10) for returning condensed water to the inlet of the secondary portion of the steam generator (12) so that a secondary portion of the heat exchanger (16) receives, at the inlet, water originating from the condenser (15) and, at the outlet, supplies heated water to the steam generator (12), and a primary portion in which there circulates the second heat-exchange gas recovered at the outlet of the primary portion of the steam generator (12) and of the heater exchangers (13a, 13b).

8. (currently amended) Device according to ~~any of~~ claim[[s]] 5 ~~to 7~~, characterised in that the intermediate heat exchanger (7) is a plate exchanger.

9. (original) Device according to claim 8, characterised in that the secondary circuit (9) is entirely closed and comprises a compressor (18) for recompressing the second exchange gas to a pressure which is substantially equal to the pressure of the first heat-exchange gas in the primary circuit (6) of the nuclear reactor (1) prior to its reintroduction at the inlet of the secondary portion of the intermediate exchanger (7).

10. (original) Device according to claim 9, characterised in that it also comprises at least one pressure equalising valve (20) connected, on the one hand, to the primary circuit (6) of the nuclear reactor (1) and, on the other hand, to a conduit of the secondary circuit (9) which provides the connection between the outlet of the compressor (18) and the inlet of the secondary portion of the at least one heat exchanger (7) so that the pressure of the first heat-exchange fluid in the primary circuit (6) of the nuclear reactor (1) and the pressure in the secondary portion of the at least one intermediate heat exchanger (7) are continuously equal to one another.

11. (currently amended) Device according to ~~any of~~ claim[[s]] 5 ~~to 10~~, characterised in that it also comprises a moderate temperature heat exchanger (30) having a first portion connection to

the secondary circuit (9) for circulation of the second exchange fluid in the moderate temperature heat exchanger (30) and a secondary portion in which there circulates a liquid such as water used in an auxiliary installation such as an urban heating circuit or a seawater desalination plant.

12. (original) Device according to claim 11, characterised in that the moderate temperature heat exchanger (30) is disposed on a conduit which bypasses a portion of the secondary circuit (9) and in that on the bypass conduit and on the portion of the secondary circuit on which the bypass conduit is placed there are disposed control valves (27a, 27b) for adjusting the throughput of the second exchange fluid in the portion of the secondary circuit and in the bypass conduit.

13. (currently amended) Device according to ~~any of~~ claim[[s]] 5 ~~to 12~~, characterised in that it comprises at least two nuclear reactors (1a, 1b) each having a primary circuit (6a, 6b) in which a coolant gas circulates and at least two intermediate heat exchangers (7a, 7b) each having a primary portion disposed on a respective primary circuit (6a, 6b) of a nuclear reactor (1a, 1b) for receiving the coolant gas from the nuclear reactor (1a, 1b) and a secondary portion disposed on a respective junction (9a, 9b) of a secondary circuit for receiving the second heat-exchange fluid, a stop valve (21a, 21b) being disposed on each of the junctions (9a, 9b).

14. (original) Device according to claim 13, characterised in that a pressure equalising valve (20a, 20b) is connected to each of the junctions (9a, 9b) of the secondary circuit and to each of the primary circuits (6a, 6b) of the nuclear reactors to maintain a pressure of the second exchange gas in the secondary portion of a respective heat exchanger (7a, 7b) substantially equal to a pressure of the coolant gas in the primary portion of the heat exchanger (7a, 7b).